Seeb, J. E., C. Habitcht, and G. D. Miller. 1993. Use of triploids for gene conservation of salmonids. Pages 67-68 [In] M. R. Collie and J. P. McVey, editors. Interactions between cultured species and naturally occurring species in the environment. Proceedings of the twenty-second U.S.-Japan Aquaculture Panel Symposium, UJNR Technical Report No. 22. Alaska Sea Grant College Program Report AK-SG-95-03, University of Alaska Fairbanks.

Abstract: The use of triploid fish has been promoted for many management applications (Ihssen et al. 1990, Thorgaard 1992). Stocking of triploid salmonids instead of diploids may promote long-term conservation of biodiversity. Stocking diploids can result in unwanted hybridization, predation, or competition with native species (Taggart and Ferguson 1986, Garcia de Leÿniz et al. 1989, Mork 1991). Triploids are reproductively sterile, thereby eliminating the potential for hybridization (Allen et al. 1986). In many salmonids, sterility also means that fish will live longer, resulting in some trophy individuals (Lincoln and Scott 1984, Donaldson et al. 1993). If competition or predation problems arise between stocked triploids and native species, then halting stocking would eliminate these interactions within one life cycle. Interestingly, proposed uses in aquaculture include gene conservation as well as enhanced meat production (Seeb et al. 1993). Several nations have considered requiring that farmed salmonids be sterilized in order to protect wild stocks from introgression due to large-scale escapes (Gausen and Moen 1991, Lura and Saegrov 1991). Triploidy has also been suggested by some workers as a prerequisite to the use of transgenic fish (Kapuscinski and Hallerman 1990, Seeb and Miller 1990). Problems with triploid production and performance occasionally have been reported, but these problems are not consistent and depend on the species examined and on the production environment. For example, achieving 100% triploids in production lots can be an elusive goal with some species, limiting conservation applications. Additionally, triploids have exhibited growth superior to (Scheerer et al. 1987), equal to (Habicht et al. 1994), or inferior to (Solar et al. 1984) the corresponding diploid controls depending on the species tested and rearing environment. Finally, there is a risk that triploid males may try to spawn with diploid females in wild-stock areas, disrupting wild-stock production (Masaru et al. 1993). These factors make it difficult to form generalizations concerning usage of triploids. Successful applications will depend on project goals, and managers must balance the needs of gene conservation against the possibility of reduced performance of triploids. Thought must be given to standardizing certification of triploid salmonids for stocking and to the consequences of false spawning of triploid males. Finally, managers must be aware that the risks of stocking diploids are seldom evaluated as thoroughly as are the risks of stocking triploids. Clearly, in some cases, use of diploids will have more dire consequences than the use of triploids. We believe that, given the information available now, use of triploids should be required for some types of stocking programs and most net-pen farming.

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